

Claims

- [c1] 1. A method for hardware reduction in an echo canceller, comprising:
applying an N (N is a positive integer) times divide frequency sampling operation onto an input data list of the echo canceller;
applying an N times multiply frequency sampling operation onto an output data list of the echo canceller to generate a multiplied frequency data list; and
applying a low pass filter operation onto the multiplied frequency data list to generate a low pass data list.
- [c2] 2. The method of claim 1, wherein a sampling frequency of the N times divide frequency sampling operation is adjustable.
- [c3] 3. The method of claim 1, wherein a sampling frequency of the N times multiply frequency sampling operation is adjustable.
- [c4] 4. The method of claim 1, wherein the low pass data list is used to eliminate a far-end echo signal.
- [c5] 5. The method of claim 1, wherein the step of applying the low pass filter operation onto the multiplied frequency data list to generate the low pass data list is achieved by using a low pass filter.
- [c6] 6. The method of claim 5, wherein a cutoff frequency of the low pass filter is $1/(2N)$ times of the sampling frequency of the input data list.
- [c7] 7. The method of claim 1, wherein the method is used in a receiver inside a transceiver.
- [c8] 8. The method of claim 1, wherein the echo canceller adopts a finite impulse response filter.
- [c9] 9. A method for hardware reduction in a near-end crosstalk canceller, comprising:
applying an N (N is a positive integer) times divide frequency sampling operation onto an input data list of the near-end crosstalk canceller;
applying an N times multiply frequency sampling operation onto an output data

list of the near-end crosstalk canceller to generate a multiplied frequency data list; and

applying a low pass filter operation onto the multiplied frequency data list to generate a low pass data list.

- [c10] 10. The method of claim 9, wherein a sampling frequency of the N times divide frequency sampling operation is adjustable.
- [c11] 11. The method of claim 9, wherein a sampling frequency of the N times multiply frequency sampling operation is adjustable.
- [c12] 12. The method of claim 9, wherein the low pass data list is used to eliminate a near-end crosstalk signal.
- [c13] 13. The method of claim 9, wherein the step of applying the low pass filter operation onto the multiplied frequency data list to generate the low pass data list is achieved by using a low pass filter.
- [c14] 14. The method of claim 13, wherein a cutoff frequency of the low pass filter is $1/(2N)$ times of the sampling frequency of the input data list.
- [c15] 15. The method of claim 9, wherein the method is used in a receiver inside a transceiver.
- [c16] 16. The method of claim 9, wherein the near-end crosstalk canceller adopts a finite impulse response filter.